62mm Half Bridge IGBT Module

DESCRIPTION：
- 1200V Trench / Field Stop Technology
- Low Switching Power Loss
- Positive Temperature Coefficient

TYPICAL APPLICATIONS：
- Variable-frequency Drive
- Servo
- UPS
- Inverter

V_{CES} =1200V， $I_{C\ nom}$ =450A / I_{CRM} =900A

IGBT, Inverter

MAXIMUM RATINGS

Characteristic	Condition	Symbol	Value	Unit
Collector- Emitter Voltage	Tvj=25℃	V_{CES}	1200	V
Continuous DC collector current	Tc=100℃, Tvj max=175℃	$I_{C\ nom}$	450	A
Repetitive peak collector current	t_P=1ms	I_{CRM}	900	A
Gate emitter voltage		V_{GE}	±20	V

ELECTRICAL CHARATERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector-Emitter saturation voltage VGE=15V, IC=450A Tvj=25℃ VGE=15V, IC=450A Tvj=125℃ VGE=15V, IC=450A Tvj=150℃	$V_{CE(SAT)}$		1.85 2.13 2.19	2.20	V
Gate-Emitter threshold voltage IC=17mA, VGE= VCE Tvj=25℃	$V_{GE(th)}$	5.3	5.9	6.5	V
Gate charge VGE = -15 V ... +15 V	Q_G		3.10		uC
Internal gate resistor (Tvj = 25°C)	R_{Gint}		1.84		Ω
Input capacitance f=1 MHz, VCE=25V, VGE=0V Tvj=25℃	C_{ies}		34.62		nF

Reverse transfer capacitance f=1 MHz, VCE=25V, VGE=0V Tvj=25℃	C_{res}		1.37		nF
Collector-emitter cut-off current VCE=1200V, VGE=0V Tvj=25℃	I_{CES}			2	mA
Gate-emitter leakage current VCE=0V, VGE=20V Tvj=25℃	I_{GES}			200	nA
Turn-on delay time IC=450A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=1.0Ω Tvj=125℃ (inductive load) Tvj=150℃	$td_{(ON)}$		217 228 230		ns
Rise time IC=450A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=1.0Ω Tvj=125℃ (inductive load) Tvj=150℃	tr		83 89 92		ns
Turn-off delay time IC=450A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=1.0Ω Tvj=125℃ (inductive load) Tvj=150℃	$td_{(OFF)}$		380 425 439		ns
Fall time IC=450A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=1.0Ω Tvj=125℃ (inductive load) Tvj=150℃	tf		102 109 109		ns
Turn-on energy loss per pulse IC=450A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=1.0Ω Tvj=125℃ di/dt = 3965A/μs (Tvj = 150°C) Tvj=150℃ (inductive load)	$E_{(ON)}$		26.38 36.60 41.24		mJ
Turn-off energy loss per pulse IC=300A, VCE=600 V Tvj=25℃ VGE=±15 V, RG=3.3Ω Tvj=125℃ dv/dt = 4938V/μs (Tvj = 150°C) Tvj=150℃ (inductive load)	$E_{(OFF)}$		35.87 40.24 41.81		mJ
Short circuit (SC) data VGE≦15 V, VCE=800 V VCEmax=V_{CES}-Ls_{CE}·di/dt t_P≤10us, Tvj=150℃	I_{SC}		2512		A
Temperature under switching conditions	Tvj op	-40		150	℃

Diode, Inverter

MAXIMUM RATINGS

Characteristic	Condition	Symbol	Value	Unit
Repetitive peak reverse voltage	Tvj=25℃	V_{RRM}	1200	V
Continuous DC forward current		I_F	450	A
Repetitive peak forward current	t_P=1ms	I_{FRM}	900	A
I²t -value	t_P=10ms, sin180°, Tvj=125°C	I^2t	40000	A^2s

ELECTRICAL CHARATERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Forward voltage IF=450A, VGE=0 V Tvj=25℃ IF=450A, VGE=0 V Tvj=125℃ IF=450A, VGE=0 V Tvj=150℃	V_F		2.30 2.46 2.38	2.80	V
Peak reverse recovery current IF=450 A, Tvj=25℃ -diF/dt =3965A/µs(Tvj=150°C) Tvj=125℃ VR=600 V ,VGE= -15 V Tvj=150℃	I_{RM}		250 288 307		A
Recovered charge IF=450 A, Tvj=25℃ -diF/dt =3965A/µs(Tvj=150°C) Tvj=125℃ VR=600 V ,VGE= -15 V Tvj=150℃	Q_r		34 51 61		uC
Reverse recovered energy IF=450 A, Tvj=25℃ -diF/dt =3965A/µs(Tvj=150°C) Tvj=125℃ VR=600 V ,VGE= -15 V Tvj=150℃	E_{rec}		14.53 21.06 25.04		mJ
Temperature under switching conditions	Tvj op	-40		150	℃

Module

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Isolation test voltage RMS, f=50Hz, t=1min	V_{ISOL}		4000		V
Internal isolation			AL_2O_3		

Storage temperature	T_{STG}	-40		125	℃
Mounting torque for modul mounting	M	3.0		6.0	Nm
Terminal Connection Torque	M	2.5		5.0	Nm
Weight	W		312		g

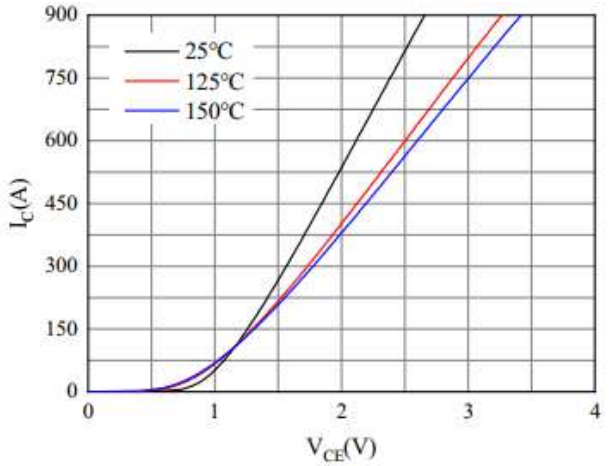


Figure 1. Typical output characteristics (VGE=15V)

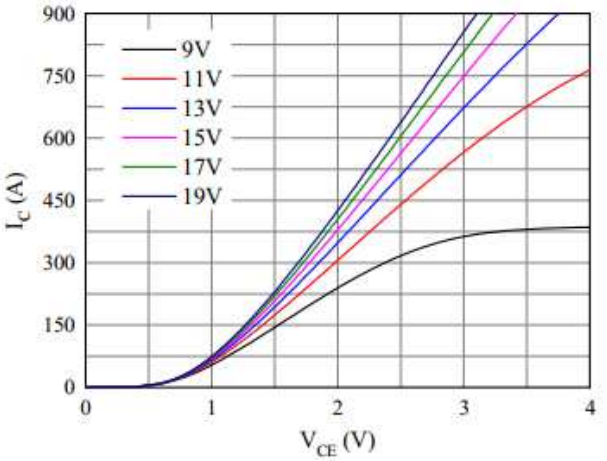


Figure 2. Typical output characteristics (Tvj=150℃)

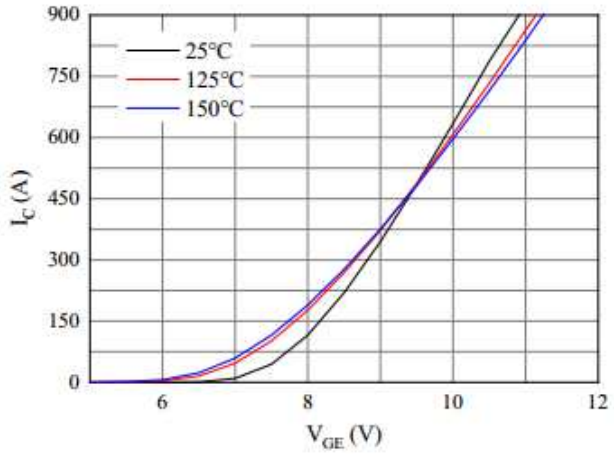


Figure 3. Typical transfer characteristic(VCE=20V)

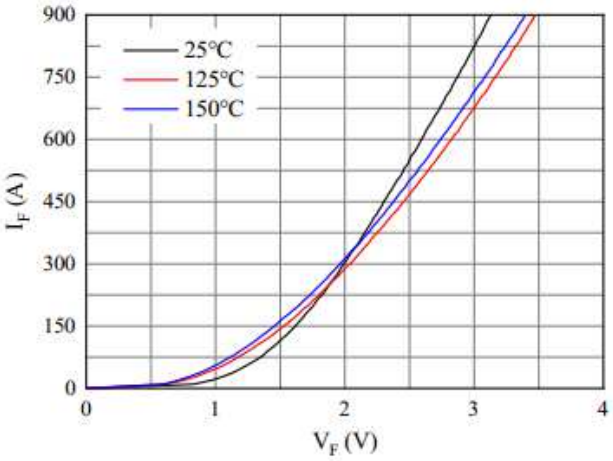


Figure 4. Forward characteristic of Diode

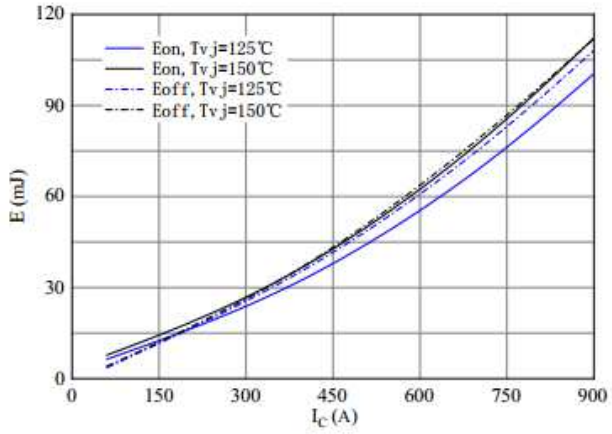


Figure 5. Switching losses of IGBT
VGE=± 15V, RGon=1.0Ω, RGoff=1.0Ω, VCE=600V

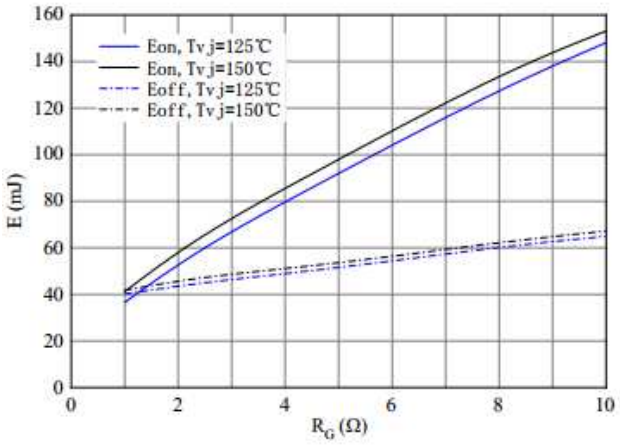


Figure 6. Switching losses of IGBT
VGE=± 15V, IC=450A, VCE=600V

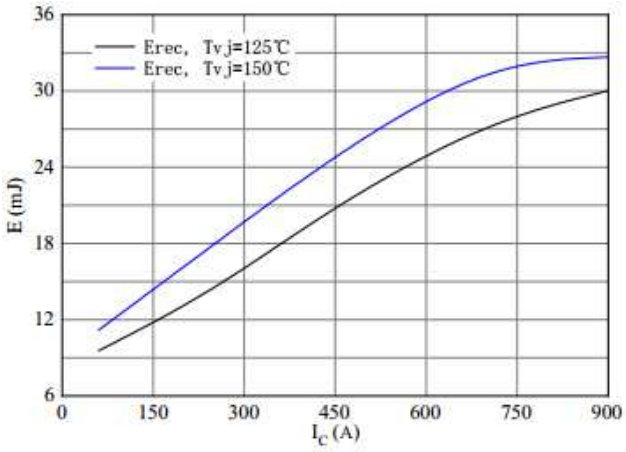


Figure 7. Switching losses of Diode
RGon=1.0Ω, VCE=600V

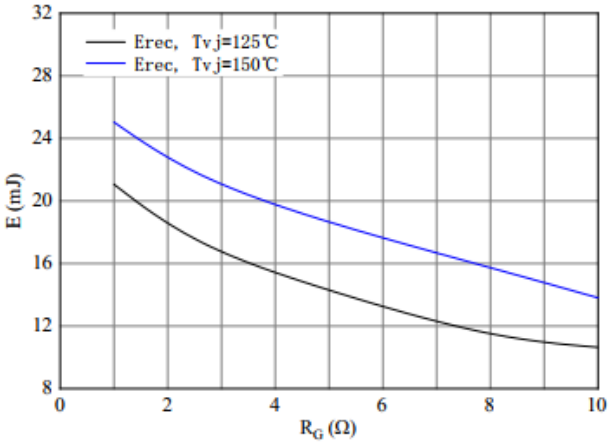


Figure 8. Switching losses of Diode
IF=450A, VCE=600V

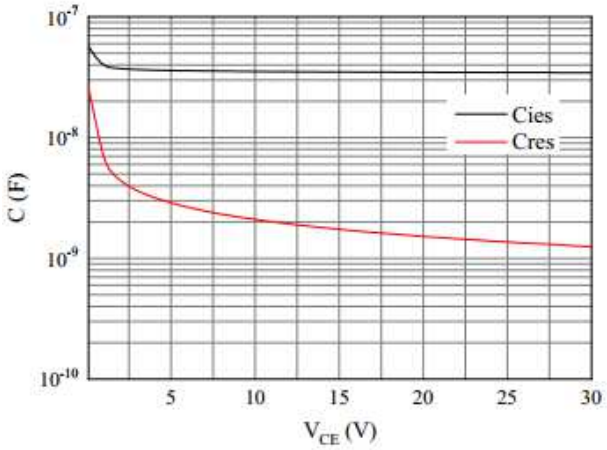
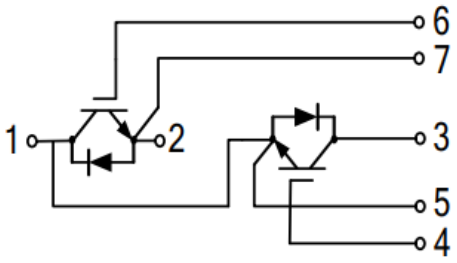
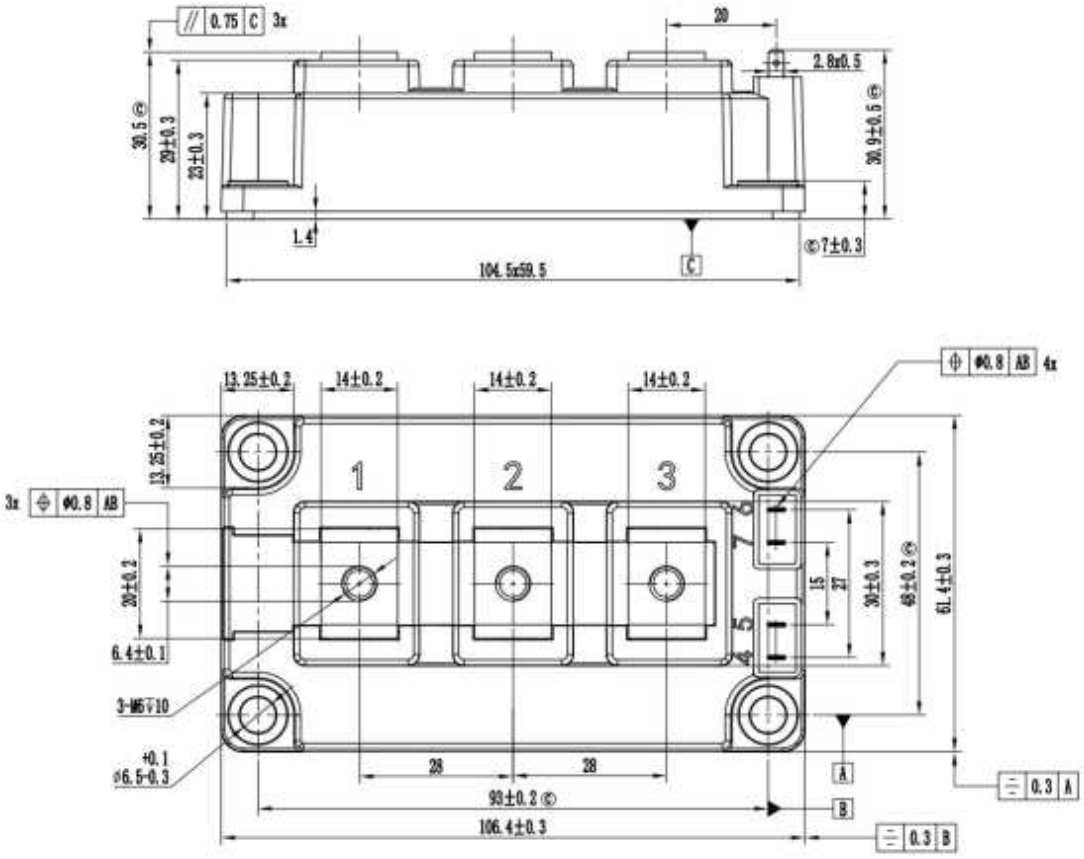


Figure 9. Capacitance characteristic

• Circuit diagram



• Package outlines : Dimensions in (mm)



Remark: 1. © control key dimensions
2.Unmarked tolerances shall be implemented in accordance with GB/T1804-m

Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life (atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)